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# PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

### Cueing System for Television

We, PYE LIMITED, a British Company of Radio Works, St. Andrews Road, Cambridge, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The growing complexity of television networks, with transmitters for different areas linked by V.H.F. channels and land-lines has introduced the need for a cueing system to facilitate the insertion of local announcements, regional broadcasts, alternative advertisements, and the like into different programmes. It has already been proposed to employ a visible cue signal in one corner of the picture, so that the appropriate equipment or studio control operator can be warned and cued. This cue signal may take the form of a small specially modulated area in a corner of the picture.

However, there are several disadvantages with this arrangement, one being the fact that as the cue signal has been inserted into the picture area it has to be transmitted and may sometimes be a distraction to viewers. Another disadvantage has become apparent now that automatic switching and cueing are being increasingly used. To obtain automatic action with such a cue signal it would be necessary to gate a particular section of several successive lines, and feed the signal contained in this reference portion to some form of monitoring circuit. Moreover although the gated cue signal could be modulated as desired it would be necessary to provide some means to ensure that the normal picture content of the reference portion could never give a false cue.

The present invention consists in a cueing system for television, wherein at least one line of the frame suppression period of the television waveform contains plural different cue signals occurring one after another throughout the line period.

Each cue signal consists of a burst of a predetermined frequency and a different frequency

is employed for each different cue signal. By the use of tuned circuits at a receiver the cue signals can be separated and routed to operate different devices. With only four frequencies for the cue signals and two cue signals in one line period, the number of combinations obtainable suffices for most cueing requirements.

The generation of such cue signals is easily accomplished, and as no picture information is being transmitted during the frame suppression period, it is not necessary to gate the video waveform, but merely to add the cue signal to the television waveform.

It may be desirable in some cases also to transmit a visible cue signal located in the picture area, as previously described, for the benefit of manual control.

The invention will be further described with reference to the drawings accompanying the Provisional Specification, in which:—

Figure 1 is a simplified circuit diagram of a cue signal monitoring device, and

Figure 2 is a simplified circuit diagram of a cue signal insertion circuit.

Referring to Figure 1, a monitoring device as shown may be inserted at any desired point in a television network for extracting the cue signals. In this device the television synchronising pulses from synchronising pulse separator 1 are used to operate a gate 2 which opens for the duration of the appropriate line of the frame suppression period to pass the cue signal contained in that period. An electronic relay 3 is included, operating at twice line frequency or whatever frequency might be desired, to switch the different cue signals into the appropriate set of input circuits, each of which will contain as many tuned circuits 4 as there are different frequencies in use for cueing. Each circuit will trigger its appropriate relay or other control device 5 automatically to carry out the desired operation on receipt of the correct cue signal. Alternatively, of course, a single group of tuned circuits 4 may be used, with a more complex switching network in-

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serted between the circuits 4 and the devices 5, instead of the simple switch 3.

The insertion of cue signals into a television waveform may be achieved as is shown in Figure 2, where the synchronising pulses are fed to a pulse generator 10 which produces pulses timed to coincide with the appropriate parts (as illustrated, halves) of a line or lines during which cue signals are to be inserted during the frame suppression period. These pulses can be fed to any one of several pulse burst generators 11 operating at different frequencies, which may comprise a valve driving a resonant circuit in the anode (as shown in the first block 11) which is inductively coupled to an output line 12. Whilst the valve is conducting the resonant circuit is damped, but when a negative pulse is received from the pulse generator due to the closing of the appropriate cue switch 13, then the valve is cut off, and the resonant circuit shocked into oscillation until the valve conducts again at the end of the pulse. The pulse burst generators 11 may comprise a transistor instead of a valve. The outputs from the pulse burst generators are mixed with the video signal at 14, if desired in such a manner that the frequency burst is entirely above the synchronising pulse level, and so conveyed throughout the network as cueing signals. They may actually be transmitted as they will not be visible to viewers and will have no effect on the normal receiver circuits, but if it is found desirable then they may be blanked out at the transmitter.

In the simple arrangements shown, eight different cue signals are available, but it is obviously possible to increase this to twenty-four without further frequencies or time division, simply by arranging for any combination of the signals in the two half-lines to have further control significance, the selection being achieved for example by interconnection of relay contacts.

In a further modification, the cue signals may be transmitted so as to operate monitoring circuits provided in ordinary viewers television receivers. Such monitoring circuits may control any desired device, for example control the switching on of a domestic appliance at a given time, or else control a mechanism in prepayment television systems where a viewer inserts a coin into a meter or the like to render his receiver operative for a given time.

#### WHAT WE CLAIM IS.—

1. A cueing system for television, wherein at least one line of the frame suppression period of the television waveform contains plural different cue signals occurring one after another throughout the line period.

2. A system as claimed in claim 1, in which each cue signal consists of a burst of a predetermined frequency and a different frequency is employed for each different cue signal.

3. A system as claimed in claim 2, in which the cue signals of different frequency are generated in separate resonant circuits.

4. A system as claimed in claim 3, wherein the synchronising pulses from the television waveform are fed to a pulse generator which produces pulses which are respectively timed to coincide with that part of the frame suppression period in which a particular cue signal is to be inserted and these pulses are fed through selector switch means so as respectively to operate the desired one of a plurality of resonant circuits each tuned to a different frequency and whose output, representing a particular cue signal, is mixed with the television waveform during the required period.

5. A system as claimed in claim 4, in which each resonant circuit is driven by a valve or transistor which damps the resonant circuit whilst the valve or transistor is conducting but which is arranged so that the resonant circuit is shocked into oscillation when the valve or transistor is cut off by a pulse from the pulse generator.

6. A system as claimed in any preceding claim, in which the cue signals are extracted from the television waveform through a gate circuit which is controlled by pulses derived from a synchronising separator circuit to open for the durations of the appropriate parts of the frame suppression period which contain the cue signals in order to pass each cue signal to a tuned circuit which responds to the frequency of that cue signal and in turn operates a control device whereby the desired operation is carried out upon receipt of the correct cue signal.

7. A system as claimed in claim 6, in which an electronic switch is connected to the output of the gate circuit and is operated to feed each of the cue signals to the appropriate tuned circuit.

8. A system as claimed in any preceding claim, wherein the cue signals are transmitted to operate responsive circuits in television receivers and thereby to control the initiation of an operation from the television receiver.

9. A cueing system for television substantially as described with reference to the drawings accompanying the Provisional Specification.

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